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10/009,042	12/07/2001	Poguang Wang	NU-500 XX	4399

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ART UNIT	PAPER NUMBER
1762	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.	10/009042	Applicant(s)	Wang et al
Examiner	M.L. Padgett	Group Art Unit	1762
H6			

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

Responsive to communication(s) filed on 7/12/01

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

### Disposition of Claims

Claim(s) 1-29 is/are pending in the application.

Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 1-29 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

### Application Papers

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119 (a)-(d)

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

All  Some\*  None of the:

Certified copies of the priority documents have been received.

Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

Copies of the certified copies of the priority documents have been received  
in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

### Attachment(s)

Information Disclosure Statement(s), PTO-1449, Paper No(s). 2  Interview Summary, PTO-413

Notice of Reference(s) Cited, PTO-892  Notice of Informal Patent Application, PTO-152

Notice of Draftsperson's Patent Drawing Review, PTO-948  Other \_\_\_\_\_

## Office Action Summary

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1. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are not commensurate in scope with their preambles. In independent claim 1, the preamble requires adding an electron to some unspecified chemical substance (since all matter is chemical in nature that means the electron may be added to anything!), however the steps of the claim only require that an electron be released from a surfaces or from some other unspecified chemical substance after exposure to light. As claimed the electron need never recombine with anything. Of course in the normal course of events it inherently will recombine with some atom. In other words, claim 1 reads on light making a neutral material (gas, liquid or solid) charged positively, and that is all. The preamble implies a solid material, that is then changed negatively is being formed, but this is never positively claimed. Note the work function requirement only applies to option (a).

Similarly, the claim 5 preamble states "A method for detecting an analyte via laser desorption mass spectrometry", but the steps only add an electron to an analyte, via light exposure to release the electron from either the substrate the analyze is deposited or from any other substance without limit. No detecting is ever positively claimed.

Claims 1 introduced "a surface" in line 3, hence the relationship of "a metal surface" in claim 2 to the original surface is unclear. Is the surface being changed, are there multiple surfaces,

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or are they the same surface? Also, much of 1(a) is repeated, ignoring proper antecedent terminology.

In claim 3, which “chemical substance” is being refused to? Two different ones were introduced in claim 1, hence either may read on this term which fails to differentiate between the “second...” and “said substance in a non-gaseous state”. Then later in the claim the second nomenclature is used with the new “first...” nomenclature. Consistency terminology needs to be used throughout, with clearly stated relationships, when further definition is added.

In claim 4, dependent from claim 1, “said first substance” has no antecedent basis.

Claims 6, 7 and 8 have analogous problems to those of claims 2-4.

The phrasing of claim 9 is ambiguous, as the “prior to...” statement could be taken to imply that the anionic part or group is no longer there, but this claim does not positively remove it, so it might still be attached, hence the meaning is ambiguous.

Claim 11 has three options (that are not mutually exclusive), and while claim 12 elaborates on one of them, it never positively chooses that option, so claim 12 is ambiguous as it is unclear whether or not biomolecules are necessarily chosen. Note that claim 21 that depends from 12 does not correct this problem.

In claim 17, “the entity” lacks any antecedent basis and nothing in claim 5, from which 17 depends has been claimed to be “desorbed”, do this claim has little clear connection to the independent claim as written.

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It is also noted that while not always critical, clarity would be improved by proper use of articles to show antecedent basis, i.e. "the" or "said" for (and only for) previously introduced terms, and "a" or no article for newly introduced limitation. See for example, claims 16, 20 & 28.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 5, 9-10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruen.

In Gruen, see the abstract; col. 4, lines 15-20 and 34-40; and col. 5, lines 10-48, noting the teachings of use of laser, i.e. light, to form C<sub>60</sub> or C<sub>70</sub> ions, positive and negative, where the laser provides the energy to ionize and to transfer the energy and cause fragmentation precipitates with anion and cations formed, and mass spectrometers have been used in characterizing the photo-ionization and photo-fragmentation. It should be further noted, that Gruen reads on these claims because they are so broadly (and cryptically) written, so that they lack any clear context to necessitate use for a more specific purpose. As written, the analyte may be anything analyzed, just

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as the chemical substances maybe any material, although non-gaseous is required for "first" substance.

4. Claims 2-4, 6-8, 14, 16 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruen.

While Gruen does not specify metal substrates or surfaces for deposit in their examples, they do indicate metal substrates are appropriate for fullerene ion deposits of ionized fullerene particles, hence one of ordinary skill would take this as a suggestion to employ metal substrates. Particular lasers therefore wavelengths, for photoionization, etc., are not given, however one would have been expected to choose lasers with wavelengths corresponding to the absorption wavelength of the materials to be treated to effect the deposit, and solid carbon targets from which the ionized fullerene for deposit are formed, generally require wavelengths in the range claimed, i.e. more than 300 nm, with energy density be determined via routine experimentation, depending particular laser, source material, etc. It is noted that as the substrates are not taught to be polished, one would not expect them to be polished, and would have no reasons to necessarily polish, thus covering claim 27.

5. Claims 1, 5, 11-12, 14-15, 18 and 21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Cottrell et al.

In Cottrell et al, see the abstract; col. 1, lines 5-24 and 45-59 and col. 2, lines 1-38 for sample analysis by laser desorption mass spectrometry, where a sample is prepared by dissolving in a solvent, and applying the solution to "a matrix material on a spectrometer target". The matrix

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material contains various biomolecules, including peptide in a trifluoroacetic acid solution. For the analysis a nitrogen laser producing 337 nm photons is employed, and the matrix material may serve as a mediator for transferring energy from the photons to the sample molecules (analyte). The matrix material contains groups with relevant electron pairs, thus enabling the implied electron transfer.

6. Claims 2-4, 6-10, 13, 16-17, 19-20 and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cottrell et al as applied to claims 1, 5, 11-12, 14-15, 18 & 21 above, and further in view of Hutchens et al or Koster.

Cottrell et al, while depositing their matrix material solution on the mass spectrometer target, do not disclose what that target is made of, however it would have been obvious to use standard mass spectrometer targets substrates/probes, as suggested by Cottrell et al's generic disclosure. Either Hutchens et al (abstract; col 1, lines 30-47; col. 2, lines 42-61; col. 3, lines 30-52; col. 4, lines 10-42; col. 5, lines 1-col. 6, lines 63) or Koster (abstract; col. 6, lines 22-col. 7, line 6; col. 8 line 23-40; col. 10, line 3-7, 12-30+ and 55-67; col 12, lines 3-39; col. 14, lines 1-28 and 43-55; col. 15, lines 35-62; and col. 16, lines 33-45+) provide relevant mass spectrometer teachings applicable to the Cottrell et al process. Particularly note Hutchens et al (col. 1) deposits matrix material on metallic probe tips, recommending steel, or Ni-plated material or Pt, while Koster teaches steel, Au, Ag, Al and Cu in col. 14, thus metals in general or particular metals would have been obvious as the substrate or target material to use for Cottrell et al's generic teaching due to its demonstrated effectiveness for that purpose.

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All the specific mechanistic descriptions of the claims are not set out in detail in Cottrell et al or the secondary references, but they describe the expected behavior of the photo- processes and the laser desorption mass spectrometry analysis. Particular ionization potential and work functions of materials, cannot be measured by the PTO, but as analogous material are employed, analogous properties and characteristics would have been expected. Also noted that since the matrix material used and discussed include acidic material, they would be ionic in nature, thus anionic and cationic groups, so that reactions in the matrix and analysis would have been expected.

7. Any inquiry concerning this communication should be directed to M.L. Padgett at telephone number 308-2336 on Monday-Friday from about 8:30 am to 4:30 pm; and Fax # (703) 872-9310 (regular) 872-9311(after final) and 305-6078 (informal).

MPadgett:evh

4/4/03

4/10/03



MARIANNE PADGETT  
PRIMARY EXAMINER